

Cross-Platform Rexx

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Overview

- Rexx in a virtual machine
 - then ...
 - ... and now
- Virtual machines and Linux
- Virtual I/O

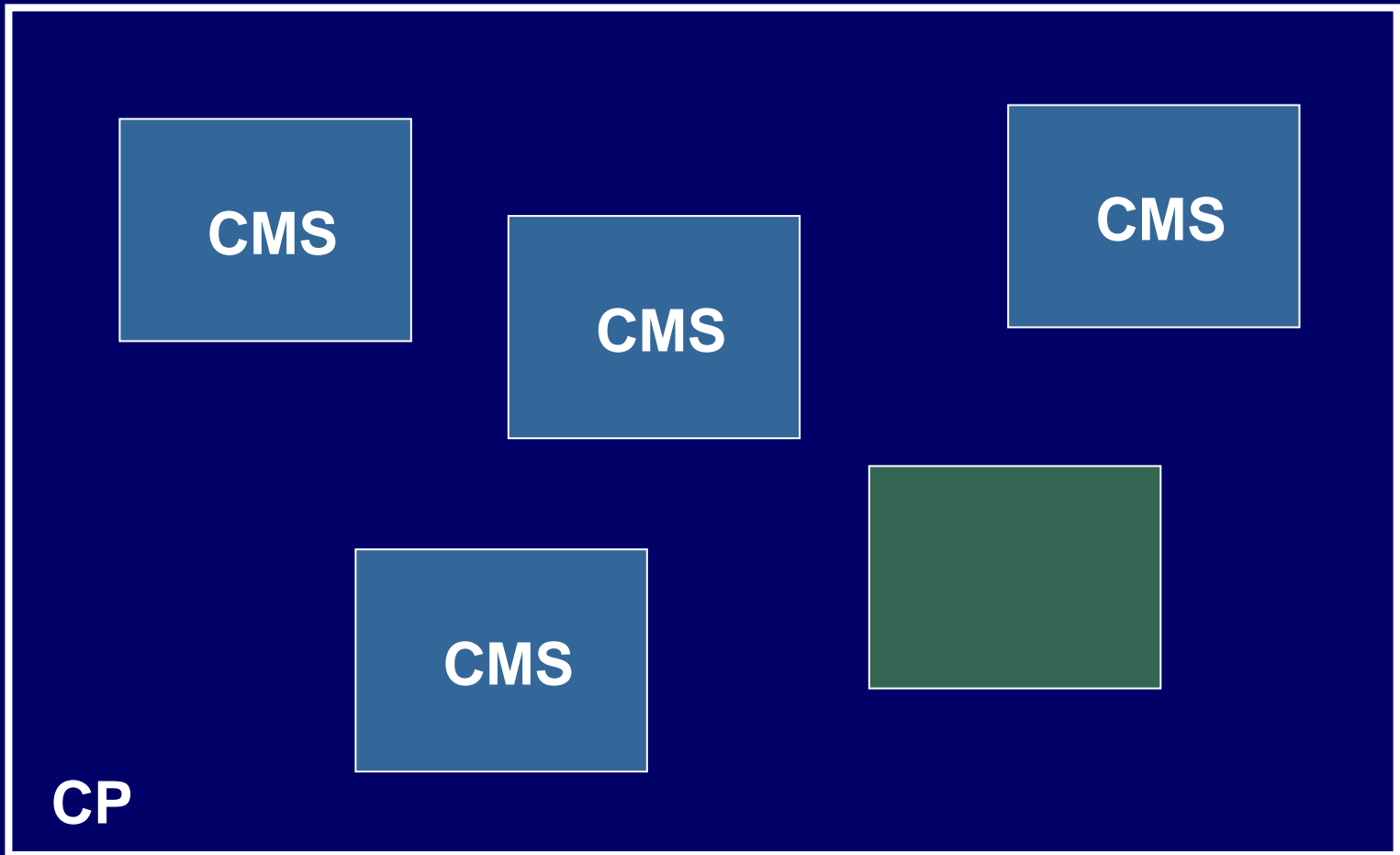
Acknowledgements

- Mark Miesfeld – ooRexx for Debian Linux, and much patient help
- Michael Saunby – ARM ooRexx & x11vnc
- Rick McGuire – quick fix for CALL, *etc.*
- ... and lots of others on RexxLA and Maemo mailing lists, *etc.*

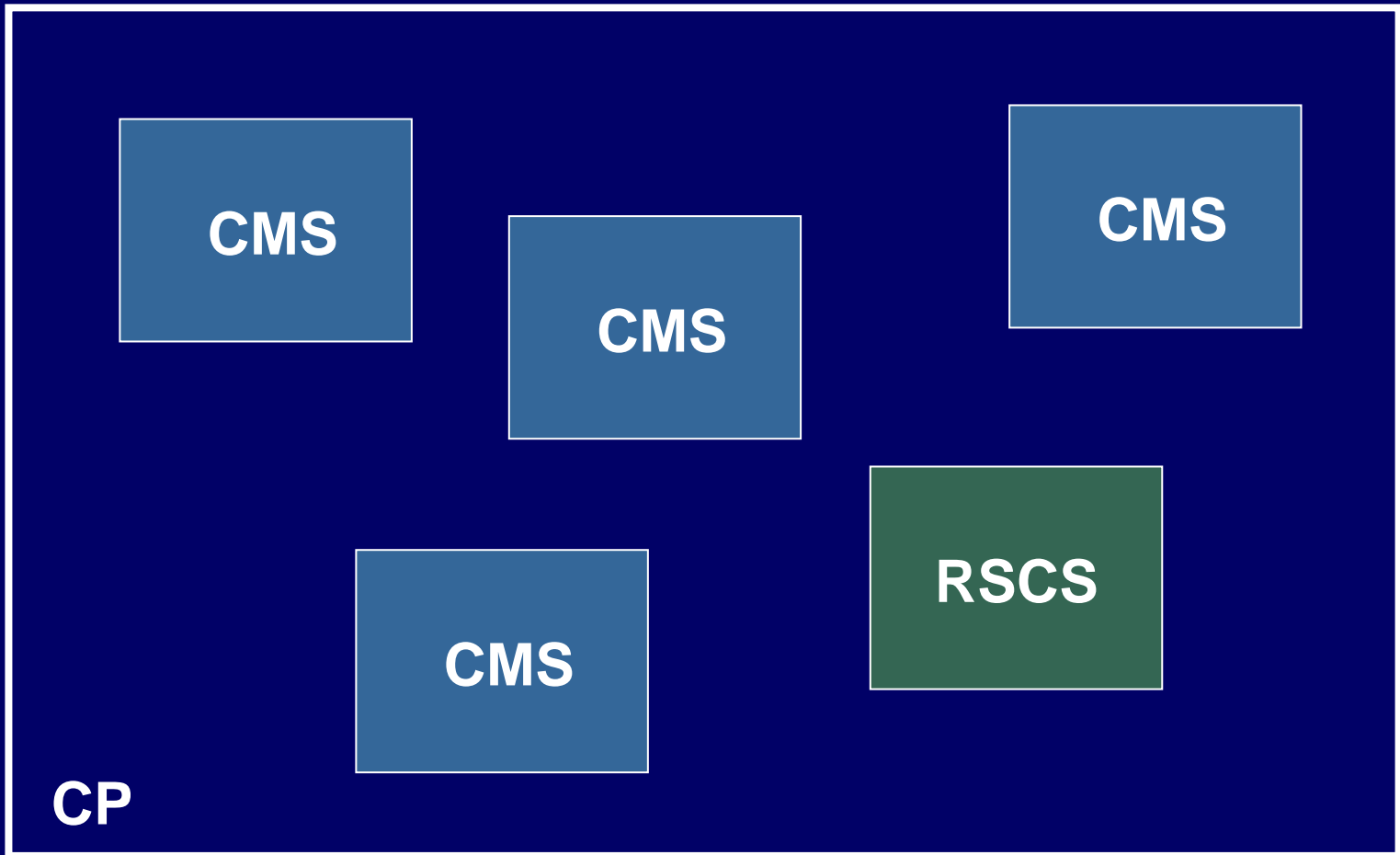
Rexx 1979

- Rexx was first written on a IBM S/370 mainframe, running CMS (Cambridge or Conversational Monitor System)
- CMS was a single user operating system
- It ran in a *virtual machine*, under the 'Control Program', CP ...

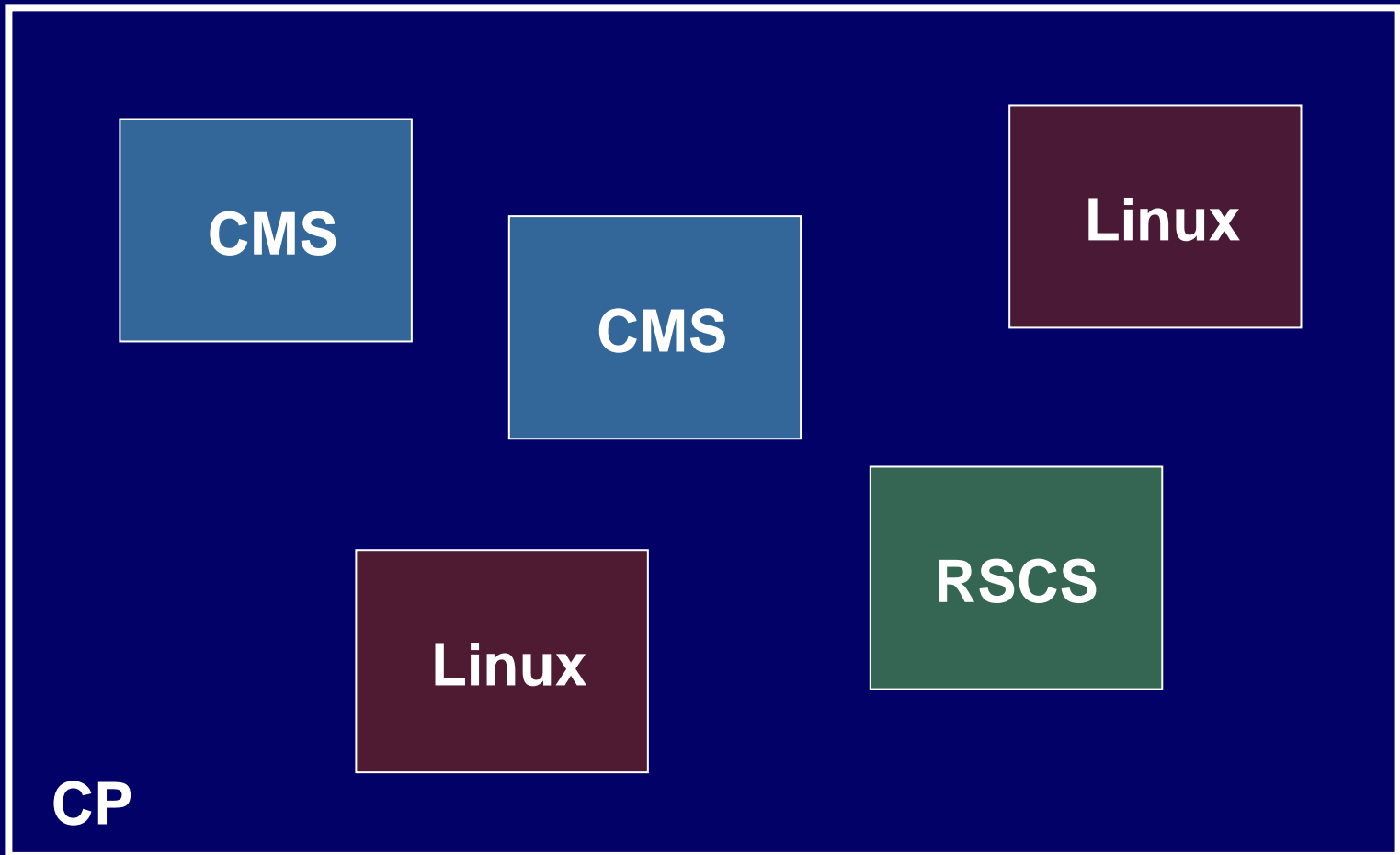
CP and CMS



CP and CMS and RSCS



... or Linux



Virtual Machines

- Buzzword: “Virtualization”
- VMs allow running many different operating systems on the same machine
 - *e.g.*, for testing, software development ...
- Many varieties of VMs, including emulation (software emulation of a machine, not necessarily the same as the host)

Acorn System 1 emulator

- The Acorn system 1; a 6502-based machine:



<http://www.cary.demon.co.uk/acorn/>

Acorn System 1 emulator

- Emulator for the 6502-based machine, on Windows:



Windows

- Single user operating system, running directly on hardware (originally DOS-based, now on NT base)
- Now has many free VM options, including
 - Virtual PC (Microsoft)
 - QEMU (open source, better on Linux)
 - VMWare (EMC subsidiary)

VMWare on Windows

- Several versions:
 - Player (free) for running existing virtual machines
 - Server (free) for creation, customization, and running of virtual machines
 - Workstation and ESX Server
- VMWare Player is sufficient for what I need, and is less resource-hungry than Server

VMWare on Windows

(Demo)

VMWare on Windows

ubuntu Linux

Ethernet ...

USB ...

Display/KB/Mouse ...

Sound ...

Disks ...

Windows XP

ubuntu on VMWare setup

- VMWare 'Virtual Appliance' (775MB)
 - <http://www.vmware.com/vmtn/appliances/directory/693>
- Startup (boot), set user and password
- Set time/zone
- Don't install VMWare Tools update
 - if you do, do not accept default screen 800x600
- For sound, add to the .vmx file:

```
sound.present = "TRUE"  
sound.virtualDev = "es1371"  
sound.fileName = "-1"  
sound.autodetect = "TRUE"
```

ubuntu on VMWare setup [2]

- Ethernet may need 'NAT' if inside firewall
 - 'ifconfig' command should show an `eth0` or `eth1` device
 - test with Firefox
- For ooRexx, download ooRexx-zzzz-3.1.2.deb
 - just click on the file to install
 - can then run `foo.rex` with the command (in Terminal):
`rexx foo.rex`

ubuntu on VMWare setup [3]

- Accessing shared disks can be tricky
 - Lots of bad information on the Internet
 - Use Places – Connect to Server – Windows Share, or Places – Network Servers to browse windows network to the shared disk/directory
- Install Samba file system ('**smbfs**') using app. manager or Synaptic (full Samba is not needed)
- Mount the share so it's part of Linux file system...

ubuntu on VMWare setup [4]

- Make an empty directory under Linux home:
 - `mkdir public`
- Set the super-user bit on smbmnt [sic]:
 - `sudo chmod u+s /usr/bin/smbmnt`
- Mount the Windows share as 'public':
 - `smbmount //MFC4/public public`
 - (the smbmount has to be re-done after boot)

Why Rexx on Linux?

- Same reasons as anywhere else, of course, but I have a specific application
- Speleogroup website (<http://www.speleogroup.org>) contains 'expedition logs', written up on location – nowadays using Wiki notation
- Wiki is converted to HTML using a (large) Rexx program (2000+ lines)

Previous technology

- NEC 780 Handheld PC (£70 on eBay)
 - running BREXX on Windows CE [640 x 240]
 - edit, convert, and display single page only



2007 technology

- Nokia N800 Internet Tablet (\$400)
 - runs Maemo (Debian) Linux
 - ARM processor
 - 800 x 480 display (4" touch-screen)
 - WiFi, Bluetooth, and USB connectivity
 - Camera
 - 2 SD card slots
 - Opera web browser, Video, MP3, *etc.*
 - 3 hours per charge, several days on standby

2007 technology

Nokia N800 with SU-8W Bluetooth keyboard



Speleogroup on N800

- Plan **A**: single page edit and view
 - too easy
- Plan **B**: port GoServe web server and MemoWiki to the N800
 - almost too hard

Porting to ARM Linux

- **GoServe** – many changes to details of sockets; weird problems with pthreads, *etc.*
 - single-thread for now, but it works
- **ooRexx** – 3.1.1 had a link problem; tried to build 3.1.2 for Debian on ARM
 - partly successful build
 - currently using Michael Saunby's **3.1.2** with workaround (copied **/usr/lib/ooRexx** files to **/usr/lib**)

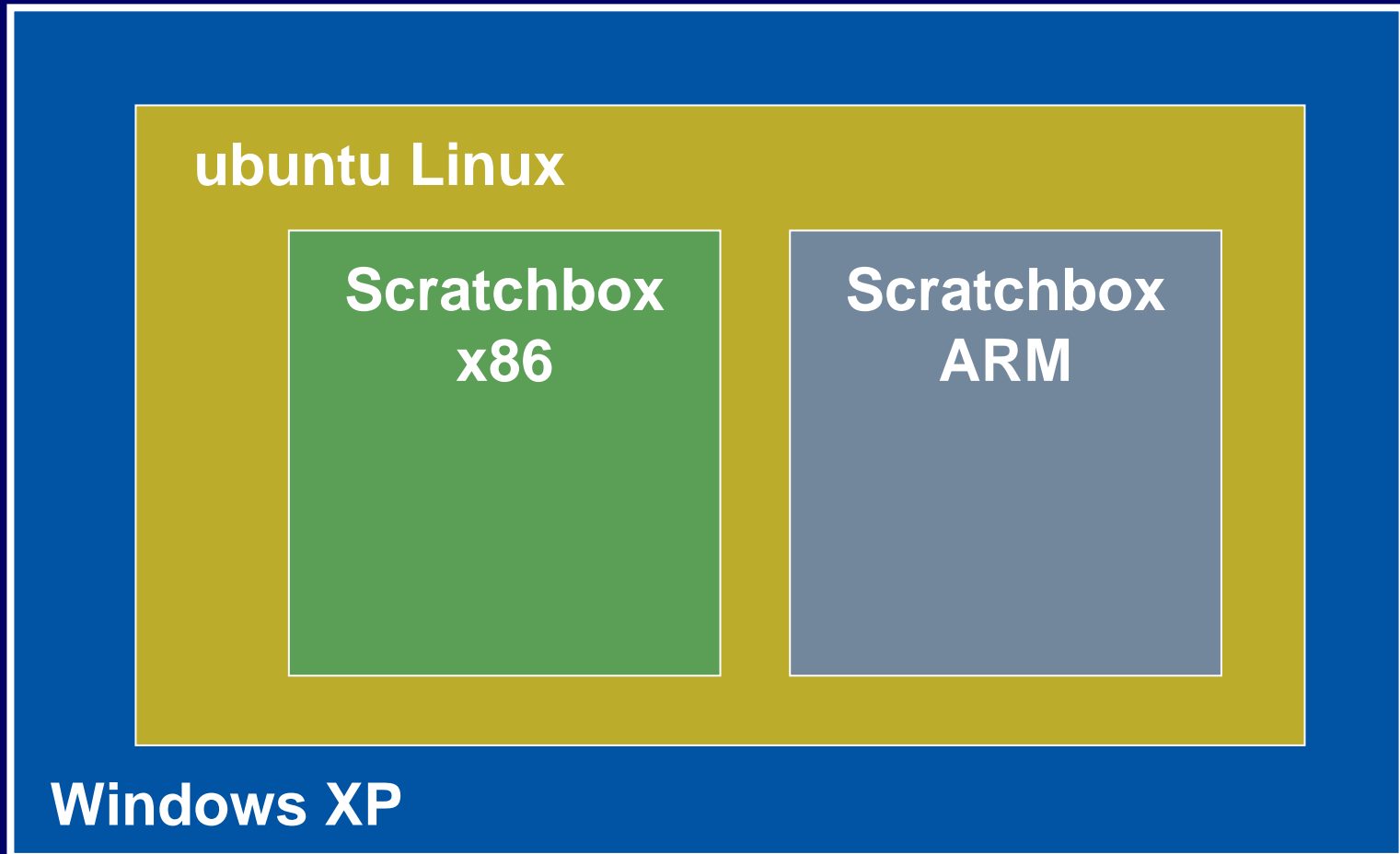
Building and debugging for ARM?

- Could do it all on the real device
 - a bit fiddly and slow, even with Bluetooth KB
 - no one else does that, so no C compiler port
- The answer is ...

Building and debugging for ARM?

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... more virtual machines!

VMWare on Windows



Scratchbox VM

- Runs the same Linux as the N800
- Uses GCC for compile, running on x86, with cross-compile to ARM (emulated using QEMU)
- Many programs run OK in the ARM 'box', but the emulation is not perfect
 - *e.g.*, cannot issue commands from ooRexx, but this works just fine on the real device

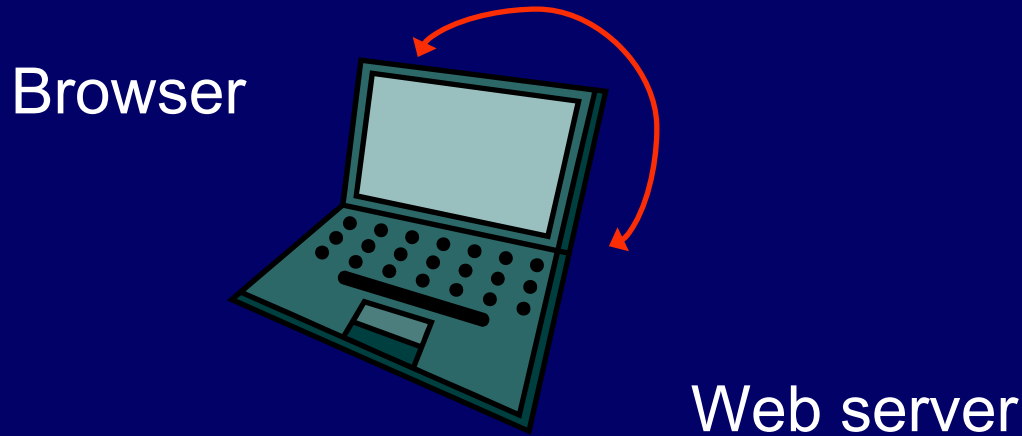
Scratchbox on ubuntu Linux on Windows

(Demo)

What's a Wiki?

- From “wiki wiki” — Hawaiian for *quick*
- Allows the creation and editing of web pages using only a browser
 - makes it easy to add links between pages
 - has shorthand for markup
- MemoWiki is written in Rexx (see RexxLA symposium 2005)

Browser & Web Server



.... on the same computer (address is <http://127.0.0.1>)

Testing and running

- Running and testing on the actual device is essential
 - a big help is more virtualization:
x11vnc VNC (Virtual Network Computing), a virtual display
 - another Michael Saunby port
 - and it's good for demos, too ...

MemoWiki on the N800

(Demo)

Questions?

